GEOTECHNICAL INVESTIGATION FOR PROPOSED WORK AT DR K SHIVARAMA KARANTH LAYOUT, SECTOR NO 1, BDA, YELAHANKA, BANGALORE

Report for

Customer

The office of The Executive Engineer

Bangalore Development Authority

Dr.K. Shivarama Karantha Layout (DSKL), Division-1, #108G, 5th Cross, MLA Layout, RMV 2nd Stage, Bhoopasandra, Bengaluru-560094

Report No – GCS-03-30608-31

Location: Ramgondanahalli,

Yelahanka

FOR 25MLD STP ,RAMAGONDANAHALLI

GOOLY CONSULTANCY SERVICES

No. 230, Opp. G R. Lavender Apartments, Sai Enclave Layout,
Kothanur Dinne, J. P. Nagar, 8th Phase,
Bengaluru- 560076

Tel: 080-42277023, 8971585823

Email: goolylab@gmail.com, info.gooly@gmail.com, www.goolyconsultancy.com

ABBREVIATIONS

LL	–	Liquid Limit
PL	–	Plastic Limit
PI	–	Plasticity Index
SPT	–	Standard Penetration Test
RQD	–	Rock Quality Designation
CR	–	Core Recovery
C	–	Cohesion
Φ	–	Angle of Internal Friction
NP	–	Non-Plastic
UCS	–	Unconfined Compressive Strength
G	–	Specific Gravity
NMC	–	Natural Moisture Content
GWT	–	Ground Water table
DS	–	Disturbed Sample
UDS	–	Undisturbed Sample
RL	–	Reduced Level
SBC	–	Safe Bearing Capacity

Gooly Consultancy Services Bangalore

Geotechnical Investigation for Proposed Dr K Shivarama Karanth Layout, Sector No 1, BDA, Yelahanka, Bangalore

---

1 INTRODUCTION:

Gooly Consultancy Services were commissioned for carrying out Geotechnical Investigation for the **Proposed** Work at **Dr K Shivarama Karanth Layout, Sector No 1, BDA, Bangalore.** The work involved field study of the soil condition as per the geotechnical investigation specifications. This report presents the results of the investigation along with an assessment of the soil type, its bearing capacity, its physical behavior etc. and guidelines regarding the proposed foundation.

2 PURPOSE OF STUDY:

- The overall purpose of this study is to investigate the stratigraphy at the site and to develop geotechnical recommendations for foundation design and construction. To accomplish these purposes, study was conducted in the following phases:
- Six numbers of Boreholes of size 100 mm dia were drilled using manual Auger up to refusal depth in order to ascertain the sub-soil strata.
- Conducting SPT tests in the borehole at 1.50-meter intervals depth or when change of strata, whichever is earlier as per IS 2131-1981
- Collecting representative soil samples at different depths in the Borehole as per IS 1892 - 1979.
- Analyzing all field and laboratory data.
- To evaluate allowable safe bearing capacity of soils to design foundations

3 LOCATION OF PROJECT SITE:

The proposed Work is located at Dr K Shivarama Karanth Layout, Sector No 1, BDA, Yelahanka, Bangalore. The investigation was carried out at six locations as shown by client.

GAGAN RAO. M
QUALITY MANAGER
Authorised Signatory

Gooly Consultancy Services Bangalore

4 FIELD METHODOLOGY

4.1 Soil Investigation:

The sinking of the boreholes were carried out by employing auger technique using a Manual Auger. The boreholes were drilled up to 2.0m to3.0m depth from the existing ground level (EGL). Disturbed samples were collected from the borehole in split spoon sampler during drilling at appropriate depths and logged. After completion of the drilling boreholes kept under observation for ground water monitoring for 24 hours after which they were backfilled.

4.2 Standard Penetration Test:

The Standard Penetration Tests was conducted at regular intervals in the boreholes to determine penetration resistance as per IS 2131-1981. The no. of blows was recorded at every 15-cm penetration up to 45 cm penetrations. The number of blows required to drive the sampler for 30 cm beyond seating drive is termed as penetration resistance 'N'. Refusal is said to have been reached when the sampler penetrates less than 15 cm under 50 blows. The Standard Penetration Tests (SPT) was conducted at the boreholes using the split spoon sampler as per IS-2131-1981 at various depths to determine the 'N' value of the soil.

SPT 'N' values are co-related with relative density of non-cohesive stratum and with consistency of cohesive stratum. Co-relations are tabulated below.

Table 2 - Co-Relation for Saturated SAND/ Non-Plastic SILT (Ref: IS 6403)

Relative density	N Value
Very Loose	0 to 4 Blows
Loose	4 to 10 Blows
Medium	10 to 30 Blows
Dense	30 to 50 Blows
Very Dense	50 and above

GAGAN RAO. M
QUALITY MANAGER
Authorised Signatory

Gooly Consultancy Services Bangalore

Table 3- Co-Relation for Saturated CLAY/Plastic SILT (Ref: IS)

Relative density	N Value
Very Soft	0 to 2 Blows
Soft	2 to 4 Blows
Medium Stiff	4 to 8 Blows
Stiff	8 to 15 Blows
Very Stiff	15 to 30 Blows
Hard	30 and above

5 SAMPLING AND LABORATORY TESTING:

Disturbed samples of the formation were collected from the boreholes in split spoon sampler and rock core samples by core barrels during drilling. These samples and the return water sludge were visually examined, logged and preserved for future reference.

The following laboratory tests were conducted on the Soil samples collected from boreholes:

Soil:

Natural Moisture Content as per IS 2720 (Part 2) – 1973.

Grain Size Analysis as per IS 2720 (Part 4) – 1985.

Liquid limit & Plastic limit per IS 2720 (Part 5) – 1985.

These tests were conducted as per the guidelines given in relevant Indian Standards. The test results are tabulated in Annexure IV.

6 GROUND WATER CONDITION:

Groundwater was not encountered in the boreholes at this site during the time of conducting the field investigation. No long-term monitoring of ground water was specified. Thus, the ground water conditions established is applicable for the time of investigation only. The ground water condition is subjected to climatic changes and any changes in the surrounding area. Reconfirmation of groundwater level is recommended prior to any work relating to the groundwater regime.

GAGAN RAO. M
QUALITY MANAGER
Authorised Signatory

Gooly Consultancy Services Bangalore

7 CALCULATION FOR OPEN FOUNDATION:

OPEN FOUNDATIONS - BASIS OF APPROACH

Based on sub-soil profile noticed, open foundations have been considered for various structures. IS-6403 approach has been adopted idealizing the stratum as sandy soil.

A. SBC calculations for Isolated Footing

Safe Bearing Capacity (SBC) is calculated by using procedure described in IS: 6403-2002. Ultimate bearing capacity is given by,

$$Q_u = c\, N_c\, s_c\, d_c\, i_c + \gamma\, D\, (N_q - 1)\, s_q\, d_q\, i_q + 0.5\, \gamma\, B\, N_\gamma\, s_\gamma\, d_\gamma\, i_\gamma\, w'$$

Where, Q_u	=	Ultimate net bearing capacity
c	=	Cohesion of stratum-Ignored
γ	=	Bulk Density
D	=	depth of footing = Minimum 1.5m
B	=	Width of footing considered
N_c, N_q and N_γ	=	Bearing capacity factors
s_c, s_q and s_γ	=	Shape factors, d_c, d_q and d_γ = Depth factors
i_c, i_q and i_γ	=	Inclination factors,
w'	=	Water table correction
ϕ	=	Angle of internal friction

General shear failure condition to occur.

B. SETTLEMENT CRITERIA (IS-8009 (Part-I) Approach)

The magnitude of settlement, when foundation loads are applied, depends upon the compressibility of the underlying strata and rigidity of the substructure. The safe bearing pressure is evaluated for Total settlement 50 mm for rectangle footing as per table 1 of IS: 1904.

GAGAN RAO. M
QUALITY MANAGER
Authorised Signatory

Gooly Consultancy Services Bangalore

8 RECOMMENDATIONS:

The Safe bearing pressure considering isolated footings, at different foundations depths for allowable settlement of 50mm from existing ground level are as given below.

Isolated Pad Footing:

Location: 18M Road Upstream & Downstream

BH No	Depth of Foundation from OGL (m)	Width of Footing (m)	Safe Bearing Pressure (T/M^2)
1	1.5	1.5	14
	2.0		20
2	1.5		6
	2.0		15

Location: Nala (LHS & RHS)

Sr No	Depth of Foundation from OGL (m)	Width of Footing (m)	Safe Bearing Pressure (T/M^2)
1	1.5	1.5	14
2	2.0		22

Location: 18M Road (East Side Nala & Attur Lake Connection)

Sr No	Depth of Foundation from OGL (m)	Width of Footing (m)	Safe Bearing Pressure (T/M^2)
1	1.5	1.5	20
2	2.0		25

The foundation excavation up to the recommended depth is possible by mechanical means. Care should be taken to ensure that the foundation soil is not disturbed during excavation. No loose portion may be left on the excavated floor at founding depth. The excavated floor may not be left open to nature for long and it may be well compacted before the foundation concrete is laid.

QUALITY MANAGER
Authorised Signatory

Gooly Consultancy Services Bangalore

9 DISCLAIMER:

The interpretation and guidelines contained in this report are based on the result of Boreholes and laboratory test conducted at the time of the investigation. The sub-surface conditions inferred from the data are indicative for the test location and the period in which tests have been carried out, the accuracy of which cannot be assured for locations and time other than those investigated. Additional Investigation may require necessary in case of any change in alignment and change in location of station structures.

For
Gooly Consultancy Services

GAGAN RAO. M
QUALITY MANAGER
Authorised Signatory

Gooly Consultancy Services Bangalore

BORELOGS

GOOLY CONSULTANCY SERVICES

BORE LOG

Project: Geotechnical Investigation For Proposed Work at Dr K Shivarama Karanth Layout, Sector No 1, BDA, Yelahanka, Bangalore

Date of commencement: 08.06.2023

Date of completion: 08.06.2023

Client: NCC Limited

Ground water table: Not Encountered

BH No.: 1 (18m Road Downstream)

Reduced Level: -

Location: Ramgondanahalli

Method: Manual Auger

Northing: Easting:

Depth below Existing GL (m)	Soil description	Thickness of strata (m)	Legend	Details of sampling		SPT N Value	CR (%)	RQD (%)	Remarks
				Type	Depth (m)				
0.0	Greyish Brown Stiff Clayey Sandy SILT	1.5		SPT	1.5	8/8/12			
2.0						N=16			
3.0	Greyish Brown Hard Clayey Sandy SILT			SPT	3.0	22/21/22			
						N=43			
4.0		3.0		SPT	4.5	9/13/12			
	Very Dense Silty SAND with Gravel					N=25			
5.0		0.5		SPT	5.0	50R for 8cm			
						N>100			
6.0									
7.0									
8.0									
9.0									
10.0									

BH was terminated at 5.0m depth from Existing ground level.

Note :

SPT - Standard penetration test

UDS - Undisturbed sample

R - Rebound

* - Sample not retrieved

C- Core

Engineer In Charge: Vivek

CAGAN RAO. M
QUALITY MANAGER
Authorised Signatory

Gooly Consultancy Services Bangalore

GOOLY CONSULTANCY SERVICES

BORE LOG

Project: Geotechnical Investigation For Proposed Work at Dr K Shivarama Karanth Layout, Sector No 1, BDA, Yelahanka, Bangalore

Client: NCC Limited

BH No.: 2 (18m Road Upstream)

Location: Ramgondanahalli

Date of commencement: 08.06.2023

Date of completion: 08.06.2023

Ground water table: Not Encountered

Reduced Level: -

Method: Manual Auger

Northing:

Easting:

Depth below Existing GL (m)	Soil description	Thickness of strata (m)	Legend	Details of sampling		SPT N Value	CR (%)	RQD (%)	Remarks
				Type	Depth (m)				
0.0	Greyish Brown Soft Clayey Sandy SILT	1.5		SPT	1.5	4/3/3			
1.0						N=6			
2.0	Greyish Brown Very Stiff to Hard Clayey Sandy SILT			SPT	3.0	10/10/13			
3.0						N=23			
4.0		3.0		SPT	4.5	36/50R for 10cm			
5.0						N>100			
6.0									
7.0									
8.0									
9.0									
10.0									

BH was terminated at 4.5m depth from Existing ground level.

Note :

SPT - Standard penetration test

UDS - Undisturbed sample

R - Rebound

* - Sample not retrieved

C- Core

Engineer In Charge: Vivek

GAGAN RAO. M
QUALITY MANAGER
Authorised Signatory

Gooly Consultancy Services Bangalore

GOOLY CONSULTANCY SERVICES

BORE LOG

Project: Geotechnical Investigation For Proposed Work at Dr K Shivarama Karanth Layout, Sector No 1, BDA, Yelahanka, Bangalore

Date of commencement: 08.06.2023

Date of completion: 08.06.2023

Client: NCC Limited

Ground water table: Not Encountered

BH No.: 3 (Nala RHS)

Reduced Level: -

Location: Ramgondanahalli

Method: Manual Auger

Northing: Easting:

Depth below Existing GL (m)	Soil description	Thickness of strata (m)	Legend	Details of sampling		SPT N Value	CR (%)	RQD (%)	Remarks
				Type	Depth (m)				
0.0	Greyish Brown Stiff Clayey Sandy SILT	1.5		SPT	1.5	10/8/8			
1.0						N=16			
2.0	Greyish Brown Hard Clayey Sandy SILT	1.5		SPT	3.0	26/37/50R			
3.0						N>100			
4.0									
5.0									
6.0									
7.0									
8.0									
9.0									
10.0									

BH was terminated at 3.0m depth from Existing ground level.

Note :

SPT - Standard penetration test

UDS - Undisturbed sample

R - Rebound

* - Sample not retrieved

C- Core

Engineer In Charge: Vivek

GAGAN RAO. M
QUALITY MANAGER
Authorised Signatory

Gooly Consultancy Services Bangalore

GOOLY CONSULTANCY SERVICES

BORE LOG

Project: Geotechnical Investigation For Proposed Work at Dr K Shivarama Karanth Layout, Sector No 1, BDA, Yelahanka, Bangalore

Client: NCC Limited

BH No.: 4 (Nala LHS)

Location: Ramgondanahalli

Date of commencement: 08.06.2023

Date of completion: 08.06.2023

Ground water table: Not Encountered

Reduced Level: -

Method: Manual Auger

Northing:

Easting:

Depth below Existing GL (m)	Soil description	Thickness of strata (m)	Legend	Details of sampling		SPT N Value	CR (%)	RQD (%)	Remarks
				Type	Depth (m)				
0.0	Greyish Brown Stiff Clayey Sandy SILT	1.5		SPT	1.5	6/8/10			
1.0						N=18			
2.0	Greyish Brown Very Stiff Clayey Sandy SILT	1.5		SPT	3.0	19/19/14			
3.0						N=33			
4.0	Greyish Brown Hard Clayey Sandy SILT	3.0		SPT	4.5	18/20/21			
5.0						N=41			
6.0				SPT	6.0	25/30/35			
7.0						N=55			
8.0									
9.0									
10.0									

BH was terminated at 6.0m depth from Existing ground level.

Note :

SPT - Standard penetration test

UDS - Undisturbed sample

R - Rebound

* - Sample not retrieved

C- Core

Engineer In Charge: Vivek

GAGAN RAO. M
QUALITY MANAGER
Authorised Signatory

Gooly Consultancy Services Bangalore

GOOLY CONSULTANCY SERVICES
BORE LOG

Project: Geotechnical Investigation For Proposed Work at Dr K Shivarama Karanth Layout, Sector No 1, BDA, Yelahanka, Bangalore

Date of commencement: 08.06.2023

Date of completion: 08.06.2023

Client NCC Limited

BH No. 5 (18m Road, East Side Nala Connection)

Location: Ramgondanahalli

Ground water table: Not Encountered

Reduced Level -

Method: Manual Auger

Northing: Easting:

Depth below Existing GL (m)	Soil description	Thickness of strata (m)	Legend	Details of sampling		SPT N Value	CR (%)	RQD (%)	Remarks
				Type	Depth (m)				
0.0	Greyish Brown Stiff Clayey Sandy SILT	1.5		SPT	1.5	21/21/25			
1.0						N=46			
2.0	Greyish Brown Hard Clayey Sandy SILT	1.5		SPT	3.0	25/36/50R			
3.0						N>100			
4.0									
5.0									
6.0									
7.0									
8.0									
9.0									
10.0									

BH was terminated at 3.0m depth from Existing ground level.

Note :

SPT - Standard penetration test

UDS - Undisturbed sample

R - Rebound

* - Sample not retrieved

C- Core

Engineer In Charge: Vivek

GAGAN RAO. M
QUALITY MANAGER
Authorised Signatory

Gooly Consultancy Services Bangalore

GOOLY CONSULTANCY SERVICES

BORE LOG

Project: Geotechnical Investigation For Proposed Work at Dr K Shivarama Karanth Layout, Sector No 1, BDA, Yelahanka, Bangalore

Client: NCC Limited

BH No.: 6 (18m Road, East Side Attur Lake Connection)

Location: Ramgondanahalli

Date of commencement: 08.06.2023

Date of completion: 08.06.2023

Ground water table: Not Encountered

Reduced Level: -

Method: Manual Auger

Northing: Easting:

Depth below Existing GL (m)	Soil description	Thickness of strata (m)	Legend	Details of sampling		SPT N Value	CR (%)	RQD (%)	Remarks
				Type	Depth (m)				
0.0	Greyish Brown Stiff Clayey Sandy SILT	1.5		SPT	1.5	15/20/21 N=41			
1.0									
2.0	Greyish Brown Hard Clayey Sandy SILT	1.5		SPT	3.0	25/27/50R N>100			
3.0									
4.0									
5.0									
6.0									
7.0									
8.0									
9.0									
10.0									

BH was terminated at 3.0m depth from Existing ground level.

Note :

SPT - Standard penetration test

UDS - Undisturbed sample

R - Rebound

* - Sample not retrieved

C- Core

Engineer In Charge: Vivek

GAGAN RAO. M
QUALITY MANAGER
Authorised Signatory

Gooly Consultancy Services Bangalore

LABORATORY TEST RESULTS

Laboratory Test Results of Soil Samples

BH NO	Location	Depth (m)	NMC (%)	Grain Size Distribution (%)			Atterberg Limits (%)		
				Gravel	Sand	Silt/Clay	Liquid Limit	Plastic Limit	Plasticity Index
BH 01	18m Road	1.5	11.1	0.0	18.0	82.0	39	22	17
		3.0	-	0.0	28.5	71.5	-	-	-
BH 02		1.5	-	0.0	24.5	75.5	38	23	15
		3.0	-	0.0	34.0	66.0	-	-	-
BH 03	Nala (LHS & RHS)	1.5	11.3	0.0	27.5	72.5	38	24	14
		3.0	-	3.0	51.0	46.0	-	-	-
BH 04		1.5	-	0.0	26.5	73.5	-	-	-
		3.0	-	0.0	29.0	71.0	37	22	15
BH 05	18m Road (East Side)	1.5	10.8	0.0	62.5	37.5	-	-	-
BH 06		1.5	-	0.5	64.5	35.0	30	22	8

Geotechnical Consultancy Services Bangalore

GAGAN RAO. M
QUALITY MANAGER
Authorised Signatory

SAMPLE CALCULATION

Goely Consultancy Services
Bangalore

Specimen SBC and Settlement Calculations : for Depth 1.5m from existing ground level **for 18m Road Upstream & Downstream**

Terzaghi's Bearing Capacity Factors :

ϕ	Nc	Nq	Nγ
0	5.70	1.00	0.00
5	7.30	1.60	0.50
10	9.60	2.70	1.20
15	12.90	4.40	2.50
20	17.70	7.40	5.00
25	25.10	12.70	9.70
30	37.20	22.50	19.70
34	52.60	36.50	30.00
35	57.80	41.40	42.40
40	95.70	81.30	100.40
45	172.30	173.30	297.50
48	258.30	287.90	780.10
50	347.50	415.10	1153.20

Water Table Correction Factors:

Wq	Wr
1.00	1.00

(No Water Table is Encountered)

0.50	0.50

(If Water Table touches the FL)

12.2.1. SAFE BEARING CAPACITY BASED ON TERZAGHI'S THEORY :

a) Calculation of Bearing Capacity Factors:

ϕ	Nc	Nq	Ng
25	25.1	12.7	9.7

Na= SPT = 15

b) Calculation of SBC : Over Burden Pr. = 0.2625

UBC (kg/Sq.cms) = 1.3 CNc + γ*D*Wq*Nq +0.5 * γ *B*Wg *Nγ

C	ϕ	γ	B	L	D	Nc
0.02	25	0.0018	150	150	150	15
(Kg/Sq.cms)	(degrees)	(kg/Cu.cms)	(cms)	(cms)	(cms)	(Blows)

UBC(T/Sq.m)	SBC(T/sq.m)
34.29	13.72
(T/Sq.mts)	(T/Sq.mts)

12.2.3. ALLOWABLE SETTLEMENT AS PER IS 8009 -1982 BASED ON N VALUES :

For N=39 Blows B = 1.5 m Sett Factor = 0.015

Recommended SBC = 14 T/Sq.m = 1.4kg/Sq.cms 1.40

Allowable Settlement (mm) = 21.00 < 50 mm, Hence Safe

Hence the Foundation is safe against allowable settlement of 50mm with 14.00 T/sq.m SBC

12.2.2. SAFE BEARING CAPACITY AS PER IS 6403 -1982 :

ϕ	Nc	Nq	Ng
0	5.140	1.000	0.000
5	6.490	1.570	0.450
10	8.350	2.470	1.220
15	10.980	3.940	2.650
20	14.830	6.400	5.390
25	20.720	10.660	10.880
30	30.140	18.400	22.400
32	35.500	23.200	30.200
35	46.120	33.300	48.030
36	50.600	37.800	56.500
38	61.400	48.900	78.000
40	75.310	64.200	109.410
45	138.880	134.880	271.760
50	266.890	319.070	762.890

a) Bearing Capacity Factors (IS 6403):

ϕ	Nc	Nq	Nγ
25	20.72	10.66	10.88

b) Water Table Correction Factors:

Water Table is not Found

Wq	Wr
1.00	1.00

c) Depth Factors:

Dc = 1.314 Dq=Dg= 1.157

d) Shape Factors:

Sc = 1.30 for Square & circle

Sq = 1.20 for Square & circle

Sg = 0.80 for Square 0.6 for circle

e) Load Inclination Factors:

Ic = 1.00

Iq = 1.00

Ig = 1.00

Qult (T/Sq.m) = C Nc Sc Dc Ic +q (Nq-1) Sq Dq iq + 0.5 g B Ng DgSg Ig Wg

Qult (T/Sq.m) = 51.96

Factor of Safety = 2.5 Qsafe = (T/Sq.m) Qult FS = 20.78

Minimum of the Above three SBC (T/Sq.m) = 13.72 13.70

Actual Recommended =	14.00	T/Sq.m

Goodly Consultancy Services Bangalore

LAKSHMAN RAO. N
QUALITY MANAGER
Authorised Signatory

GOOLY CONSULTANCY SERVICES

BORE LOG

Project: Geotechnical Investigation For Proposed Work at Dr K Shivarama Karanth Layout, Sector No 1, BDA, Yelahanka, Bangalore

Client: NCC Limited

BH No.: 7 (18m Road, West Side Attur Lake Connection)

Location: Ramgondanahalli

Date of commencement: 08.06.2023

Date of completion: 08.06.2023

Ground water table: Not Encountered

Reduced Level: -

Method: Manual Auger

Northing: Easting:

Depth below Existing GL (m)	Soil description	Thickness of strata (m)	Legend	Details of sampling		SPT N Value	CR (%)	RQD (%)	Remarks
				Type	Depth (m)				
0.0									
1.0	Greyish Brown Hard Clayey Sandy SILT			SPT	1.5	25/27/29			
2.0		2.0		SPT	2.0	N=56 50R for 8cm			
3.0						N>100			
4.0									
5.0									
6.0									
7.0									
8.0									
9.0									
10.0									

BH was terminated at 2.0m depth from Existing ground level.

Note :

SPT - Standard penetration test

UDS - Undisturbed sample

R - Rebound

* - Sample not retrieved

C- Core

Engineer In Charge: Vivek

Gooly Consultancy Services Bangalore

SITE LAYOUT PLAN

SWMPU & DWCC
Sector (1,2&3)
Proposed STP
50/2
Park
PARK - 1
PARK - 2
TRANSFORMER
S.T.P
34M Buffer
6m Existing Road
12m Road
18m Road
9m Road
7.5m Exist
RL - 910.783
SKT 12A
RL - 906.250
RL - 906.110
RL - 907.580
RL - 905.490
RL - 906.010
RL - 904.020
910.589
12
47/1
47/2
47/3
47/4
47/5
47/6
47/7
46/1
46/2
48
49
44
45
41
43/1
43/2
43/3
43/4
43/5
42/1
42/2
42/3A
42/3B
42/3C
42/4
42/5
50/1
36/1
36/2
36/3
36/4
36/5
36/7
36/8
37/1
40/1
40/2
40/3
40/4
40/5
40/6
40/7
40/9
40/10
40/11
40/12
27
28
29/2
29/3
58/1A6
58/1A7
35/3
35/4
35/5
33/3
12x18
9x12
6x9